

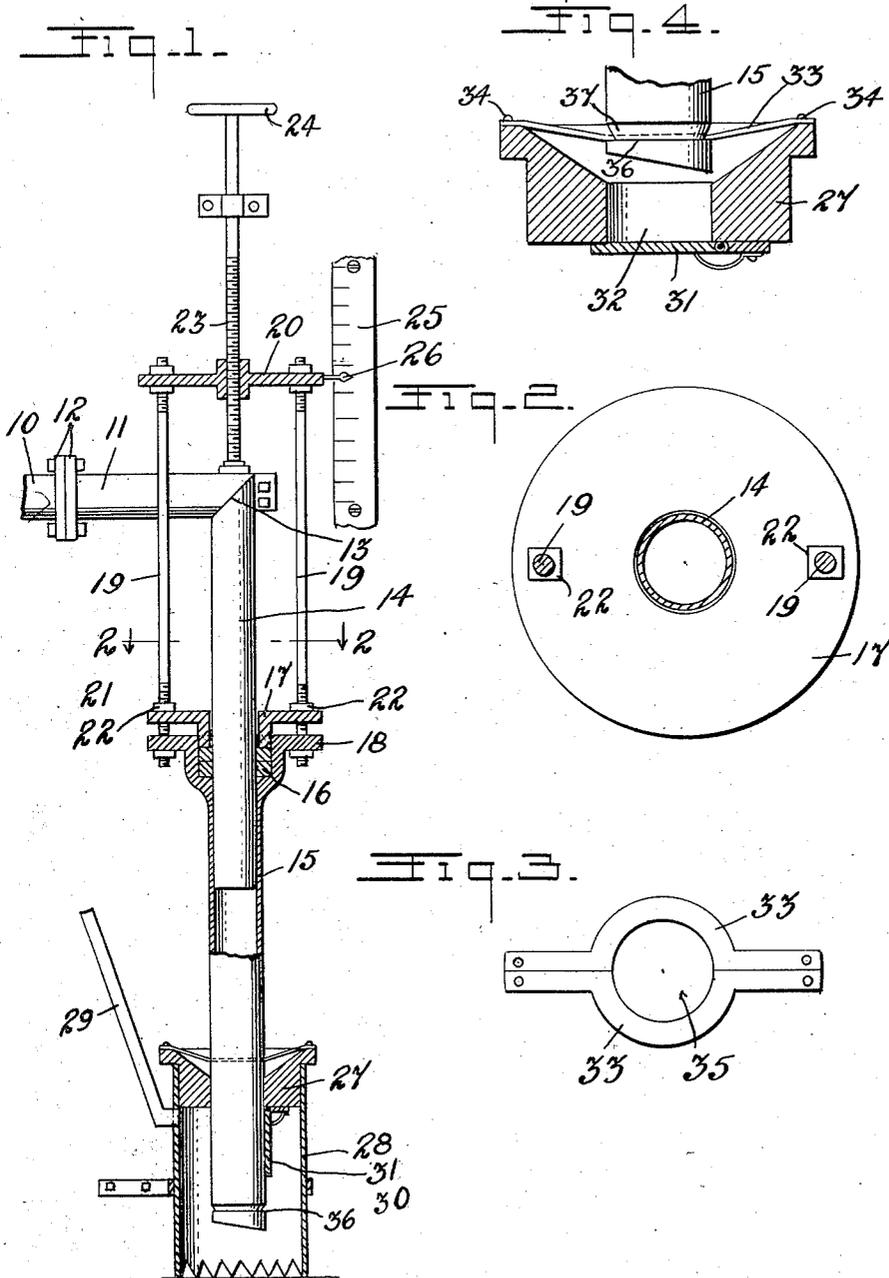
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BILGE WATER EDUCTOR

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BILGE WATER EDUCTOR

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This invention relates to bilge water eductors, and has for an object to provide improved means for extracting a stratum of water from under a stratum of oil without disturbing the oil.

It is well known that ships and especially ships employing oil as a fuel are troubled with oil floating upon the bilge water which comes from various sources. It is unlawful to discharge oil into the port waters, and means to discharge the water underlying the oil is necessary in a case a ship remains long in port.

It has heretofore been attempted to provide separators of various types for separating the oil and water after the same has been withdrawn from the bilge by the bilge pump.

The present invention is directed to an apparatus which will withdraw from the bilge the water without withdrawing the oil, and with means for adjustment so that any disclosed depth of water may be withdrawn from beneath any disclosed depth of oil without disturbing the oil floating upon the water.

The invention therefore comprises a baffle preferably though not necessarily of cylindrical form which sets upon the ship bottom at the point of lowest trim and which admits fluid only to a restricted area under the bottom of such baffle. Cooperating with the baffle is a pipe adjustable vertically within the baffle to correspond to the depth of oil upon the water, with manual means for effecting the adjustment of such pipe relative to a pipe connected with a bilge pump.

The invention further includes means to prevent attenuation of air within the baffle. The invention further includes means whereby the oil may be pumped from the surface of the water without disturbing the underlying water stratum, such means consisting in providing for the oil to be introduced into the top of the baffle with the communication from beneath closed, and the suction pipe communicating with a sump in the top of the baffle.

The drawing illustrates an embodiment of the invention and the views therein are as follows:

Figure 1 is a view in elevation, partly in section of a structure illustrating the invention,

Figure 2 is a transverse sectional view, taken on line 2—2 of Figure 1,

Figure 3 is a plan view of coacting springs for connecting the suction pipe at times with the baffle, and

Figure 4 is a diametrical sectional view, showing the connection of the suction pipe with the springs in position to skim oil from the water.

Like characters of reference indicate corresponding parts throughout the several views.

The present invention is adapted to be associated with the suction pipe of an ordinary bilge pump installation, such pipe being shown in fragment at 10. The device of the present invention is connected therewith by connecting the pipe 11 with the pipe 10 in any approved manner, flanges 12 being illustrated for the purpose.

The pipe 11 is provided with an elbow 13 and a vertical section 14. It is to be understood, that the relation of the parts 10, 11 and 12 will depend entirely upon the position of the bilge pump suction pipe as found in any particular installation.

Embracing and sliding upon the pipe 14 is a pipe 15, a stuffing box 16 being provided with a gland 17 adapted to make air and water tight connection between the pipes 14 and 15.

The pipe 15 is made to move vertically upon the pipe 14, and any convenient means for accomplishing the raising and lowering of the pipe 15 may be employed. As shown, the pipe 15 is provided with a flange or cross head 18, with rods 19 extending therefrom to a cross head 20. These rods 19 are screw threaded as at 21, and nuts 22 may be employed for exerting pressure upon the gland 17.

The cross head 20 is screw threaded to co-act with the screw 23 which is provided with means for manual actuation as the hand wheel 24. To determine visually the height of the pipe 15, a scale 25 is provided and a pointer 26 is carried by a moving part to co-act with the scale.

The pipe section 15 extends down through a head 27 into a baffle 28. This baffle 28 will ordinarily be cylindrical in form, but such cylindricality is unimportant.

At the bottom, the baffle is provided with notches through which water may flow in a very much reduced stratum. To prevent the rarefaction of air within the baffle, a vent 29 is provided.

It will be understood that these various parts above described will be attached to bulk heads or other appropriate parts. Means have been shown for such attachment, but these means are only illustrative and will be varied in accordance with the installation to which it is applied.

The head 27 is provided with a flap valve 31 adapted to close the opening 32 through which the suction pipe 15 enters the baffle 28. This valve 31 is spring closed and when the pipe is in inserted position, as shown at Figure 1, the valve is alongside the pipe, but when the pipe is raised as

shown at Figure 4, the valve automatically closes to close the opening 32.

The top of the head 27 is provided with springs 33 attached in any approved manner as by the bolts 34 and together forming a central opening 35 adapted to embrace the pipe 15. The pipe 15 is provided adjacent its lower end with a furrow 36. This furrow 36 has an inclined upper part 37, the utility of which will appear in the description of operation.

In operation, to withdraw water from beneath a stratum of oil, the baffle 28 being fixed in engagement with the bottom of the bilge, the pipe 15 is adjusted so that the lower end of this pipe will be a distance above the bottom of the bilge somewhat less than the thickness of the oil stratum. The bilge pump being now started, water will flow through the notches into the interior of the baffle, and by reason of the difference of specific gravity of oil and water, only the water will flow in, the oil being still maintained upon the surface of the water. Before the bottom of the oil stratum has been lowered to such position as to enter the notches, the open end of the pipe has been uncovered and draws in only air. Pumping is, therefore, automatically stopped at such point as to make the discharge of water, only, a certainty. It is obvious, that this pipe may be adjusted to a nicety to provide for use with strata of oil of any thickness found in practice.

At certain times, it becomes necessary to remove a quantity of oil from the bilge and without pumping the water. For this purpose, the pipe 15 is raised until the springs 33 engage in the furrow 36 which is done automatically. Engagement prevents further raising of the pipe 15 so that the end of the pipe is properly positioned. It will be obvious then, that oil will flow into the top of the head 27 which is formed hopper shape with the end of the pipe extending down into this hopper as shown at Figure 4.

The operation of the bilge water eductor will now draw the oil from this hopper, the valve 31 being closed. So long as the top of the oil stratum

is above the top of the head 27, oil will flow into the hopper, and will be withdrawn by the pump. It is, therefore, possible with the same installation to withdraw water from under the oil stratum, or the oil from the top of the water stratum. By reason of the incline 37 of the furrow 36, when the pipe 15 is lowered, it will be forced between the springs 33 down to open the valve 31, and to such distance into the baffle as use may make necessary or desirable in accordance with the foregoing description of operation.

Of course, the bilge water eductor herein illustrated may be modified and changed in various ways without departing from the invention herein set forth and hereinafter claimed.

The invention is hereby claimed as follows:

1. A bilge water eductor comprising a baffle having means at its lower limit for the introduction of fluid, a head for the baffle having a passage therethrough, a spring pressed valve for closing the passage, a suction pipe concentric with the passage adapted at times to pass through said passage and at other times to be positioned without the passage, and spring pressed means to connect the baffle and pipe whereby the movement of the pipe relative to the baffle is limited.

2. A bilge water eductor comprising a baffle having means at its lower limit for the inlet of fluid, a head for the baffle provided with an axial passage, springs forming a yielding opening concentric with the passage, a spring pressed valve for closing the passage in said head, a suction pipe inserted through the yielding opening in said springs and adapted to pass through said passage, and means to raise and lower the pipe relative to the baffle.

3. A bilge water eductor comprising a housing having passages forming inlets into the bottom, an eduction pipe and a vent pipe communicating with the housing, and means to adjust one of said pipes relative to the other to variable depths within the housing.

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